Michigan Department of Community Health

MDCH

MICHIGAN DEPARTMENT OF COMMUNITY HEALTH
EPIDEMIOLOGY OF ASTHMA FACT SHEET

JANUARY, 2000

ASTHMA IN MICHIGAN

INTRODUCTION

Between 1990 and 1997, asthma was one of the most common chronic medical conditions in Michigan resulting in an average of 10,854 hospitalizations each year for persons 1-44 years old. Fifty-six percent of hospitalizations occurred to whites.

Asthma deaths were very rare with 47 childhood (1-14) and 323 adult (15-44) deaths in the eight years. Mortality rates were higher for blacks (2.4/100,000) than whites (0.4/100,000).

HOSPITALIZATION

The overall state asthma hospitalization rate was 17.0 per 10,000 residents between 1990 and 1997. However, rates varied dramatically by age, gender and race. The hospitalization rate for blacks (46.5/10,000) was four times higher than for white residents (11.6/10,000). Male children, adult women and blacks experienced higher rates of asthma hospitalizations than other groups.

RACIAL DIFFERENCES BY COUNTY

Because of striking racial differences at the state level, county rates were separately calculated for blacks and whites. Rates were calculated for counties with at least 5,000 population for each racial group and at least 20 hospitalizations during the eight year period. The median county rate for blacks was 31.0/10,000. Figure 1 displays counties with the highest rates for blacks -- Berrien, Cass, Genesee, Saginaw, Wastenaw and Wayne. The median county rate for whites was 10.4/10,000. Figure 2 displays counties with the highest rates for whites -- Bay, Benzie, Iosco, Genesee and Jackson.

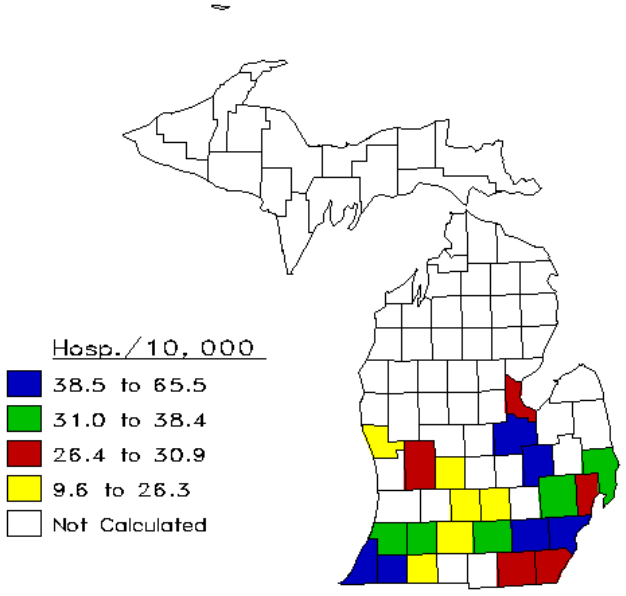


Figure 1: Asthma Hospitalization Rates Blacks, Age 1 - 44, Michigan 1990 - 1997

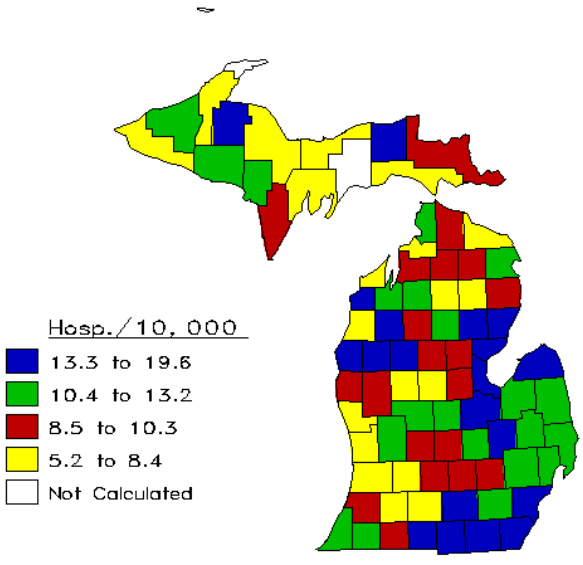


Figure 2: Asthma Hospitalization Rates Whites, Age 1 - 44, Michigan 1990 - 1997

What is Asthma?

Asthma is a chronic inflammartory disorder of the airways characterized by airway hyper-responsiveness to stimuli, variable airflow limitation and respiratory symptoms that include shortness of breath, wheezing, tightness or discomfort in the chest and dry cough. Asthma can be prevented and controlled by avoidance of triggers and use of appropriate medications.

Trends in Childhood and Adult Hospitalizations

Figures 3 and 4 illustrate consistent differences in asthma hospitalization rates between blacks and whites. Rates increased for African-American children (ages 1-14) and adults (ages 15-44)during the study period, but remained steady for white children and adults.

Racial Differences in Asthma Hospitalizations

Table 1 displays hospitalization rates and rate ratios by race. Black children and adults have a fourfold higher risk of being hospitalized for asthma than whites.

Table 1: Asthma Hospitalization Rates/10,000 and Rate Ratios by Race for Children and Adults, Michigan, 1990 - 1997

Age	White	Black	Total	Rate Ratio
1-44	11.6	46.5	17.0	4.0
1-14	19.8	78.5	30.1	4.0
15-44	8.0	29.6	11.2	3.7

Gender Differences in Asthma Hospitalizations

Table 2 displays the hospitalization rates and rate ratios by gender. Male children are almost twice as likely to be hospitalized as female children and male adults are less than half as likely to be hospitalized as adult females.

Table 2: Asthma Hospitalization Rates/10,000 and Rate Ratios by Gender for Children and Adults, Michigan, 1990 - 1997

Age	Male	Female	Total	Rate Ratio
1-44	16.4	17.7	17.0	0.9
1-14	37.6	22.2	30.1	1.7
15-44	6.6	15.7	11.2	0.4

Hospitalization Rates by Age, Race and Gender

Rates were highest in preschool children, decreased to a low at age 20 and then increased to age 44 (Figure 5). After age 15, female rates exceeded male rates. Rates were always higher for blacks regardless of age. This was especially true for pre-school black males (165.9/10,000), three times that of white males. By age 40, black women experienced almost four times as many hospitalizations (52.8/10,000) as white women (14.6/10,000).

Figure 3: Asthma Hospitalization Rates by Race and Gender, Age 1-14, Michigan, 1990 - 1997

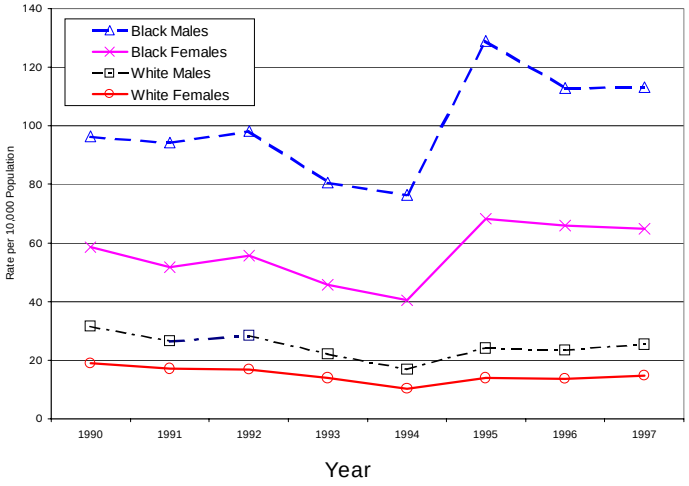


Figure 4: Asthma Hospitalization Rates by Race and Gender, Age 15-44, Michigan, 1990 - 1997

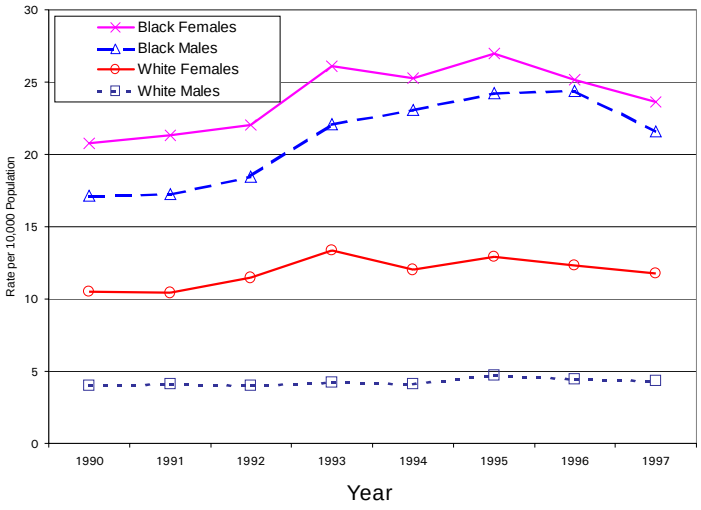
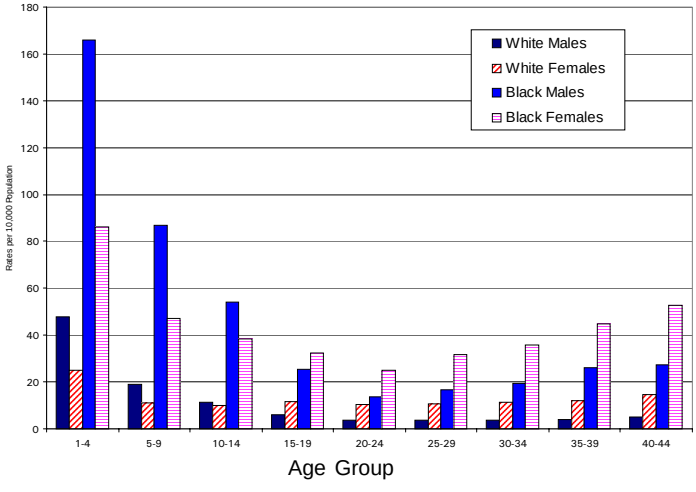


Figure 5: Asthma Hospitalization Rates by Race and Gender and Age Group, Michigan, 1990 - 1997

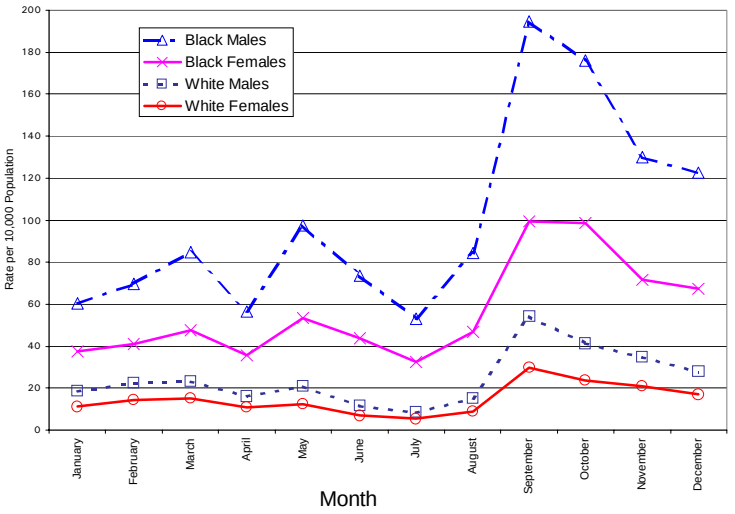


Seasonal Patterns in Asthma Hospitalizations

In Michigan, asthma hospitalizations exhibited distinct seasonal patterns with a peak in hospitalization rates during the early fall months (Figure 6). Black children actually experienced three spikes — late winter, early spring, and early fall.

Although both racial groups experienced a fall peak in hospitalization rates, this graph once again illustrates the higher burden of asthma in black children than white children throughout the year. This difference is likely due to poor disease management or inadequate pharmacological control, and to potential differences in exposure to triggers.

Figure 6: Asthma Hospitalization Rate for Children by Month and Race Michigan, 1990 - 1997



CAUSES AND TRIGGERS OF ASTHMA

Factors associated with the onset or development of asthma include pre-existing allergies, family history of asthma or allergy, exposure to tobacco smoke, viral respiratory infections, smaller airways at birth and in early life, sedentary lifestyle during childhood, male gender and low birth weight. Following the onset of asthma, acute exacerbations can occur following exposure to triggers commonly found in both outdoor and indoor environments. Triggers include upper-respiratory infections, allergens, environmental tobacco smoke, irritants produced by kerosene and wood stoves, outdoor air pollutants, vigorous exercise, exposure to cold air or sudden temperature change, and excitement or stress. Common indoor allergens include pollens, fungal spores, mold, animal dander, feathers, house dust mites, cockroaches, cleaning fluids, perfumes, and certain foods, especially those containing sulfites. Outdoor air pollutants associated with asthma exacerbations include ozone, sulphur dioxide, nitrogen dioxide, and particles with a diameter of < 10 micrometers and < 2.5 micrometer. However, associations between asthma exacerbations and exposure to each air pollutant were not consistent among studies.

PREVENTION OF ASTHMA EXACERBATIONS

Asthma patients should avoid allergens to which they are sensitive, and interventions should include the reduction of indoor allergens listed above. In addition, patients suffering from rhinitis and sinusitis should seek treatment, and patients with persistent asthma should be vaccinated against influenza. Asthma patients with persistent symptoms requiring daily medications should consult their clinician to identify specific allergen sensitivities. Identification of allergen sensitivities includes the use of a patient history to assess sensitivity to seasonal allergens and skin testing or in vitro testing to assess sensitivity to perennial indoor allergens. Clinicians should assess the significance of positive tests given the patient's medical history to make treatment decisions. Outdoor air quality interventions that reduce asthma-related illness have not been reported in the scientific literature. Asthma patients should avoid physical exertion when levels of air pollution are high.

RESOURCES

FOR LOCAL ASTHMA COALITION INFORMATION - http://www.mdch.state.mi.us/pha/epi/esd/Asthma/

Epidemiology Services Division
Michigan Department of Community Health
3423 ML King, Jr. Blvd., P.O. Box 30195
Lansing, MI 48909
517-335-8806

American Lung Association of Michigan
http://www.alam.org 1-800-LUNG-USA

Asthma and Allergy Foundation of America, Michigan Chapter
aafamich@aol.com 1-888-444-0333

Centers for Disease Control and Prevention
Asthma Prevention Program
http://www.cdc.gov/nceh/programs/asthma

National Heart, Lung and Blood Institute
National Institutes of Health
P.O. Box 30105, Bethesda, MD 20824-0105
http://www.nhlbi.nih.gov

National Institute Environmental Health Science
http://www.niehs.nih.gov

METHODS

Mortality data from the 1990-1997 Michigan Resident Death File (MRDF) and hospitalization data from the 1990-1997 Michigan Inpatient Data Base (MIDB) were obtained from the Division for Vital Records and Health Statistics, Michigan Department of Community Health. MRDF certificates coded as ICD-9 493.0-493.9 as the underlying cause of death were analyzed. The MIDB contains records of each admission for all short-stay acute care facilities in Michigan and cases with a primary diagnosis of ICD-9-CM 493.0-493.9 were selected. Only data for Michigan residents aged 1 - 44 were analyzed. Infants less than one year were excluded because of the difficulty in diagnosing asthma in infants. Residents age 45 and over were also excluded because of the difficulty in distinguishing asthma from other chronic respiratory conditions in older adults. Population estimates for rate calculations were obtained from the Michigan Office of the State Demographer.

Suggested citation: Lyon-Callo S, Reeves MJ, Wahl R, Hogan JG. Epidemiology of Asthma Fact Sheet, Bureau of Epidemiology, Michigan Department of Community Health.

For information about the Epidemiology of Asthma Fact Sheet, contact the Epidemiology Services Division (517) 335-8806

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